## REMARKS

Claims 1-15 are pending in the application. No claims are amended or added in this paper.

### *Claim Rejections – 35 U.S.C. § 102*

In the Office Action, claim 1-15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Sonnenschein et al., US 2002/0033227. In the Office Action it was alleged that a two-part polymerizable composition of Sonnenschein et al. US '227 contains all of the ingredients of the instant two-part adhesive formulation. For example the Examiner assembled a two-part polymerizable composition in the Office Action from ingredients separately taught in Sonnenschein et al. US '227. One of the ingredients mentioned in the Office Action was cross-linking agent, polyethylene glycol diacrylate, of Sonnenschein et al. US '227. It was alleged in the Office Action that the polyethylene glycol diacrylate cross-linking agent of Sonnenschein et al. US '227 is an example of the instant neutral or basic surfactant and that Sonnenschein et al. US '227 teach a two-part polymerizable composition wherein one of the two parts comprises an organoborane/amine complex, water, and the polyethylene glycol diacrylate cross-linking agent.

Applicants disagree. Applicants will show that the instant two-part adhesive formulation is not literally or inherently taught by Sonnenschein et al. US '227 and that the two-part polymerizable compositions of Sonnenschein et al. US '227 lack required elements of the instant two-part adhesive formulation.

Applicants note that the Sonnenschein person of Sonnenschein et al. US '227 is the same person as the Sonnenschein of the instant application and that person knows the differences between the invention of Sonnenschein et al. US '227 and the instant invention. The below remarks first describe basic polymerizable compositions of Sonnenschein et al. US '227, then describe the basic polymerizable compositions further comprising one or more additives, carrier, or solvent, and finally describe a polymerizable composition of a specific embodiment of polymerizable compositions that is a two-part adhesive composition. Applicants will then show that these polymerizable compositions of Sonnenschein et al. US '227 either comprise genuses or a species, none of which anticipate the instant invention.

Sonnenschein et al. US '227 teaches basic polymerizable compositions in [0012] and [0013] as being a one-part or two-part polymerizable composition comprising an amine organoborane complex and one or more of monomers, oligomers or polymers having olefinic unsaturation which are capable of polymerization by free radical polymerization. The composition can undergo polymerization by heating it or exposing it to an effective amount of a decomplexing agent. The decomplexing agent is kept separate from the polymerizable composition until initiation of polymerization is desired. The polymerizable composition can be used as, among others, an adhesive composition.

Sonnenschein et al. US '227 teaches in [0055] that the basic polymerizable compositions can be either a one-part or two-part composition, depending upon the mechanism used to initiate polymerizations. The mechanism is either employing an effective amount of the decomplexing agent or heating without a decomplexing agent. In one embodiment the mechanism is employing an effective amount of the decomplexing agent and the polymerizable composition is two-parts in which one part contains the complexes of the invention and the other part contains the decomplexing agent. In this embodiment the complexes of the invention refer to the aforementioned amine organoborane complex and the one or more of monomers, oligomers or polymers having olefinic unsaturation.

Referring again to [0055] when heating is the mechanism used to initiate polymerization no decomplexing agent (initiator) is needed. When heating is used, the basic polymerizable composition can be in either one-part or two-parts. In one embodiment where heating is used, the polymerizable composition is in two parts. Since no decomplexing agent (initiator) is needed when using heating to initiate polymerization, the two-part polymerizable composition naturally comprises one part that contains the amine organoborane complex and another part contains the one or more of monomers, oligomers or polymers.

Thus there are two different basic two-part polymerizable compositions of Sonnenschein et al. US '227. For convenience they are designated here as basic two-part polymerizable composition (A) or (B):

For use with decomplexing agent initiation mechanism there is basic two-part polymerizable composition (A): (i) one part comprising the amine organoborane complex and one or more of monomers, oligomers or polymers having olefinic unsaturation which are capable of polymerization by free radical polymerization and (ii) another part comprising the decomplexing agent (i.e., initiator); or

For use with heat initiation mechanism there is basic two-part polymerizable composition (B): (i) one part comprising the amine organoborane complex and (ii) another part comprising the one or more of monomers, oligomers or polymers having olefinic unsaturation which are capable of polymerization by free radical polymerization.

Also, Sonnenschein et al. US '227 teaches in [0060] that the polymerizable compositions may further comprise a variety of optional additives. Examples of the additives mentioned in Sonnenschein et al. US '227 are thickeners [0060], elastomeric materials [0061], cross-linking agents [0062], peroxides [0063], inhibitors [0064] and [0068], non-reactive colorants and fillers [0065], pigments [0068], UV stabilizers [0068], and powder coating additives [0068]. Referring to [0062], there an example of the cross-linking agent includes, among others, polyethylene glycol diacrylate.

Also, Sonnenschein et al. US '227 teaches in [0068] that the polymerizable compositions can further comprise a carrier such as water or a solvent.

Also, Sonnenschein et al. US '227 teaches in [0070] the amine organoborane complexes can be dissolved in a variety of solvents including water or organic solvents.

Also, Sonnenschein et al. US '227 teaches in [0085] a specific embodiment of the basic polymerizable composition (A) that is a two-part adhesive composition. Ingredients of a first part of the two parts of the two-part adhesive composition include the organoborane/amine complex (i.e., hardener) mixed with an acrylic resin and an antioxidant. Ingredients of a second part of the two parts of the two-part adhesive composition are more of the acrylic resin and an initiator (i.e., decomplexing agent). In each of the two parts, ingredients of the acrylic resin are methylmethacrylate (MMA) and polymethylmethacrylate (PMMA). The antioxidant is 2,6-

ditertbutyl-4-methylpheol (BHT). The initiator is, for example, acrylic acid and functions to decomplex the organoborane/amine complex when the second part is mixed into the first part of the two-part adhesive composition. (The ingredients are present in specific amounts not repeated here.) Thus, in the specific embodiment of the basic polymerizable composition (A) that is the two-part adhesive composition:

First part ingredients are:

(i) organoborane/amine complex;

(ii) certain mixture of MMA and PMMA; and

(iii) BHT antioxidant; and

Second part ingredients are:

(i) more certain mixture of MMA and PMMA; and

(ii) acrylic acid.

Thus the two-part polymerizable compositions of Sonnenschein et al. US '227 can in some embodiments further comprise a wide variety of additives, carrier, or solvent. But Sonnenschein et al. US '227 does not teach any two-part polymerizable composition wherein one of the two parts comprises the particular combination from the Office Action of the organoborane/amine complex, water, and the polyethylene glycol diacrylate cross-linking agent (or any cross-linking agent or, for that matter, a neutral or basic surfactant). Instead such a two-part polymerizable composition was mentioned for the first time by the Examiner in the Office Action after a reading of the instant specification.

Turning to the instant invention, instant claim 1 relates to a two-part adhesive formulation comprising:

in a first part, water, a surfactant which is a neutral or basic surfactant or a combination thereof, and a protected alkylborane complex; and,

in a second part, an acrylic monomer and a trialkylborane-displacing initiator.

Instant claims 2-12 depend directly or indirectly from claim 1.

Instant claim 13 relates to a method comprising the step of contacting a surfactant-stabilized aqueous dispersion of a trialkylborane-organonitrogen complex with a acrylic

monomer and a trialkylborane-displacing initiator to form a curing acrylic-based adhesive; and applying the curing adhesive to a low surface energy substrate. Instant claims 14-16 depend directly from claim 13.

*Sonnenschein et al. US '227 Does Not Literally Teach Instant Combination*

Turning now to the §102(b) rejection, Applicants have already shown that Sonnenschein et al. US '227 does not teach a genus or species of a two-part polymerizable composition wherein one of the two parts comprises the particular combination of the organoborane/amine complex, water, and the polyethylene glycol diacrylate cross-linking agent (or a neutral or basic surfactant). Although Sonnenschein et al. US '227 mentions water and polyethylene glycol diacrylate as respective examples of a carrier or solvent and a cross-linking additive, nowhere does the reference specifically teach a polymerizable composition embodiment that employs the water or polyethylene glycol diacrylate, either separately or together. Instead that particular combination is first mentioned in the Office Action after a reading of the instant specification. In contrast in the instant two-part adhesive formulation, the first part comprises water, a surfactant which is a neutral or basic surfactant or a combination thereof, and a protected alkylborane complex. The instant first part is not taught by Sonnenschein et al. US '227.

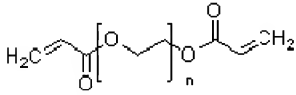
*Sonnenschein et al. US '227 Does Not Inherently Teach Instant Combination*

The two-part polymerizable compositions of Sonnenschein et al. US '227 are not inherently the two-part polymerizable composition wherein one of the two parts comprises the particular combination of the organoborane/amine complex, water, and the polyethylene glycol diacrylate cross-linking agent (or any cross-linking agent). Instead Sonnenschein et al. US '227 teaches a variety of additives, carrier, or solvent that can be combined with one or two of the parts of the reference basic two-part polymerizable composition. The combination of Sonnenschein et al. US '227 is not inherently organoborane/amine complex, water, and the polyethylene glycol diacrylate cross-linking agent (or any cross-linking agent) to a skilled artisan. (See *Akzo N.V. v. International Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241 (Fed. Cir. 1986), where claims to a process for making aramid fibers using a 98% solution of sulfuric acid were not anticipated by a reference which disclosed using sulfuric acid solution but which

did not disclose using a 98% concentrated sulfuric acid solution. Further, it was even found that concentrated sulfuric acid is not inherently 98% sulfuric acid to one skilled in the art.)

*Sonnenschein et al. US '227 Missing instant claim elements*

The basic two-part polymerizable composition (B) of Sonnenschein et al. US '227 lacks the instant "trialkylborane-displacing initiator." Further, Sonnenschein et al. US '227 does not teach an additive that is a neutral or basic surfactant. Applicants disagree with the unsupported technical assertion in the Office Action that the polyethylene glycol diacrylate cross-linking agent of Sonnenschein et al. US '227 would be an example of an instant neutral or basic surfactant. The Office Action has not adequately established a plausible technical basis for this allegation. The polyethylene glycol diacrylate cross-linking agent is a bis(acrylate end-capped) polyethylene glycol polymeric material lacking a neutral protic or basic functional group and having a structure of general formula:



In contrast, polymeric materials exhibiting neutral or basic surfactant activity typically are characterizable as having a plurality of repeat units, at least some of the repeat units having neutral protic (e.g., -$CH_2OH$ or -CON(H)-) or basic (e.g., -$CO_2Na$) functional groups. See instant claim 4 for examples of such polymeric materials that are neutral or basic surfactants. The polyethylene glycol diacrylate cross-linking agent of Sonnenschein et al. US '227 lacks such neutral protic or basic functional groups. Thus, Applicants believe that the burden on the Office of establishing that a cross-linking agent such as polyethylene glycol diacrylate could also technically function as a neutral or basic surfactant has not been met in the Office Action. That is, the Office Action has not adequately established, and Applicants do not agree, that cross-linking agent polyethylene glycol diacrylate could also function as a neutral or basic surfactant in the first part of the two-part adhesive formulation of the instant invention. Thus, Applicants believe that the basic two-part polymerizable composition (A) of Sonnenschein et al. US '227 lacks the instant neutral or basic surfactant. Accordingly, Sonnenschein et al. US '227 does not teach all of the claim elements in instant claims 1-15.

For each of the several reasons provided above, Sonnenschein et al. US '227 does not teach a two-part polymerizable composition having all of the required ingredients of the instant two-part adhesive formulation and so the two-part adhesive formulation of instant claims 1-12 is novel and not anticipated by Sonnenschein et al. US '227. Similarly, Sonnenschein et al. US '227 does not teach the instant surfactant-stabilized aqueous dispersion of a trialkylborane-organonitrogen complex with an acrylic monomer and a trialkylborane-displacing initiator. Accordingly, the method of claims 13-15 of employing the surfactant-stabilized aqueous dispersion of a trialkylborane-organonitrogen complex with an acrylic monomer and a trialkylborane-displacing initiator to form a curing acrylic-based adhesive and applying the curing adhesive to a low surface energy substrate is novel and also not anticipated by Sonnenschein et al. US '227. Thus instant claims 1-15 are patentable under 35 U.S.C. § 102(b) over Sonnenschein et al. US '227.

***Claim Rejections – 35 U.S.C. § 103***

In the Office Action, claim 16 is rejected under 35 U.S.C. § 103(a) as allegedly being obvious over the same Sonnenschein et al. US '227 reference. Applicants disagree.

The instant application is a §371 application from PCT/US2005/004097. Applicants enclose herewith a copy of their previous response of record to PCT Written Opinion that amended claim 1 to add the instant limitation of a neutral or basic surfactant. Applicants' response to PCT Written Opinion also provided a basis for nonobviousness of claim 16 (as well as claims 1-15) and evidence in support thereof in a form of an analytical report, which is also enclosed herewith. Applicants hereby incorporate their previous response to PCT Written Opinion and the analytical report here by reference.

As Applicants mentioned previously in their response to PCT Written Opinion and evidenced in their analytical report, it is only when the instant neutral or basic surfactant is used that the instant protected alkylborane complex becomes stable in water. As mentioned previously, this specific combination of a neutral or basic surfactant, water, and the protected alkylborane complex is not taught or suggested by Sonnenschein et al. US '227 (i.e., reference D1 in the PCT Written Opinion). Accordingly Applicants believe that claim 16 (and claims 1-15

for that matter) is not obvious in view of Sonnenschein et al. US '227 and patentable under 35 U.S.C. § 103(a).

***Conclusion***

In view of the above amendments and remarks, Applicants believe that the rejections are overcome and the invention of claims 1-16, is patentable. Applicants request reexamination and reconsideration and allowance of claims 1-16.

The undersigned can be reached by telephone or facsimile at the numbers provided below.

Dated: December 22, 2009

Respectfully submitted,

Electronic signature: /Claude F. Purchase/
Claude F. Purchase
Registration No.: 47,871
THE DOW CHEMICAL COMPANY
2040 Dow Center
Midland, Michigan 48674
(989) 638-7710